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ABSTRACT

Typical objectives of urban planners are reviewed and 3 are selected as relevant to this study which focuses on density as a measure of the number of dwellings per given land area, as distinguished from number of persons per room. Those selected: (1) consider the juxtaposition of housing and other land uses; (2) relate density to desired patterns of social interaction; and (3) by clustering dwellings around a common open space, aim at creating a sense of place or spatial identity to contribute to residents' feelings of satisfaction. The data from the study are presented to investigate the relationship of these objectives to the reactions of residents living in neighborhoods of varying densities. In general, residents of higher density neighborhoods did not know their neighbors better and were less satisfied with their neighborhood than those residing in areas of lower density. These results indicate that some aspects of behavior, particularly social interaction, may not be related to dwelling unit densities as customarily assumed by planners, designers and social scientists. (TL)

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CONSEQUENCES OF RESIDENTIAL DENSITY FOR URBAN LIFE

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CONSEQUENCES OF RESIDENTIAL DENSITY FOR NEIGHBORHOOD LIFE

One dimension of "overcrowding" with which city planners and urban designers deal is residential density. Although a number of studies have discussed residential density from the standpoint of persons per room (e.g., Loring, 1956; Schmitt, 1977; Mitchell, 1971), this paper focuses on density as a measure of the number of dwellings per given land area. Within this context several objectives which planners and designers seek to achieve by manipulating density within residential areas are outlined. Data from a recent study are then presented to investigate the relationship of several of these objectives to the reactions of residents living in neighborhoods of varying densities.

The results indicate that some aspects of behavior, particularly social interaction, may not be related to dwelling unit densities in the way in which many planners, designers and social scientists customarily have assumed.

Planning Objectives Related to Density

Urban planners often base their plans on a number of objectives related to residential land use and more specifically to residential densities. These objectives may deal with aesthetic considerations, with the functional or economic utilization of land, or with psychological and social considerations.

First, planners and urban designers seek to foster diversity in the physical appearance of the residential communities they design. Rather than a uniform pattern of a single housing type in a given land area, the designer aims at a varied pattern of several housing types within an area (detached single family homes, townhouses, garden and high rise apartments, etc.), each of which differs in density. The average of these densities corresponds to the residential density specified on a land use plan.

A second planning objective deals with the economic use of land. In many cases the location of a parcel of land within a community determines its relative market value which in turn dictates a use of the land which will yield a reasonable return on a developer's investment or specified tax dollars to the community. If the land is designated for residential use, purely economic considerations may result in housing built at the highest allowable density within the constraints imposed by parking requirements, building setback and height restrictions and minimum housing unit size. Thus community zoning of residential land into areas of different densities often reflects economic as well as other considerations.

A third and related objective concerning residential density considers the juxtaposition of housing and other land uses. Plans for high density housing adjacent to shopping, business and entertainment centers, recreation areas, and major transportation crossings, reflect the planner's desire to concentrate large numbers of people near facilities which are intensely used. Convenience and ease of accessibility, therefore, are often viewed as important planning criteria.

Another planning objective has been suggested which relates density to desired patterns of social interaction. By clustering housing and locating dwelling entrances close to each other, planners and designers suggest that

opportunities for meeting neighbors will be facilitated and that such meetings will lead to friendships and concommitantly to greater satisfaction with where one lives.

Fifth and finally, a related objective of clustering dwellings around a common open space or courtyard aims at creating a sense of place or spatial identity to contribute to the residents' feelings of satisfaction. This objective may be difficult to achieve in low density residential areas where single family houses are spatially dispersed, but can be achieved more readily in areas designated for high density residential use.

Determining the adequacy of the higher density environments in terms of all five of the above design objectives is beyond the scope of this paper. Specifically, because accomplishing the first two objectives (variation in housing type and sufficient financial return) is dependent on local zoning and building regulations and a variety of other factors which are unrelated to the views of the residents, these objectives fall outside our more focused concern with the residents' feelings about the quality of their neighborhood environment. Before proceeding to a discussion of responses relating to the other three objectives, however, we will first review the design of the study from which the data are taken and indicate the consequences of this design for the ensuing discussion of the effects of residential density.

The Source of the Data

In the late fall of 1969, 1,253 interviews were collected in ten communities to investigate the impact of different levels of community planning on residents' attitudes and behavior with regard to transportation, outdoor

recreation, social interaction and environmental satisfaction[1]. The communities selected for study were two of the most publicized American new towns, Columbia, Maryland and Reston, Virginia, which included a range of housing types, clustered service and recreational facilities in proximity to residential areas, and the separation of pedestrian and vehicular traffic; two highly planned "new towns in-town" built on redevelopment tracts in Detroit, Michigan and Washington, D.C.; two moderately planned suburban developments in the Baltimore-Washington region which, though they included some of the amenities provided in the new towns, were planned on a much smaller scale than those communities; two suburban areas composed of eight or more minimally related small subdivisions which exemplified the consequences of minimally planned suburban sprawl in the Detroit and in the Washington metropolitan areas; and finally, a pair of older communities in the New York region, Radburn, New Jersey, (an earlier attempt at a new town planned by Clarence Stein and Henry Wright) and a nearby minimally planned suburban area.[2]

With the exception of the forty year old New Jersey communities, the sampled areas had all been developed since 1960. Similarly, except for the in-town areas, the communities were comparably located in their metropolitan areas about 13 to 20 miles from the nearest urban centers. In addition, an effort was made in the selection of communities to choose areas with residents

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[1]The initial results of the study are presented in Planned Residential Environments, Institute for Social Research, The University of Michigan, 1970, by John B. Lansing, Robert W. Marans and Robert B. Zehner.

[2]Further information about the community selection process and the areas chosen is provided in Lansing et al., Chapter I and Appendix B.

of approximately the same socioeconomic levels. The median family incomes of residents in the ten communities turned out to range from just over $15,000 to just under $22,000 per year, roughly two to three times the median income of families in the country as a whole at that time.[3]

As would be expected, higher density residential neighborhoods were not distributed evenly across the sampled communities. Rather, because only the highly planned environments tended to include a sizeable proportion of townhouses while the less planned areas were predominantly detached single family home developments, over ninety per cent of the residents in more dense neighborhoods in this study lived in one of the five highly planned communities. Percentage distributions indicating the representation of the degrees of planning density levels used in the analyses are shown in Table 1. In sum, for the discussion which follows it is worth emphasizing that while the results taken from lower density neighborhoods (under 4.50 dwellings per acre) derive from both highly planned and minimally planned settings, the responses in higher density areas (up to 25 dwellings per acre) refer almost entirely to townhouse neighborhoods in new towns and other highly planned environments where the designs of planner-developers might be expected to be closely attuned to the several planning objectives noted earlier. In addition, it should be recognized that the densities included in the study reflect a sample of affluent townhouse and single family home communities and that a "high" density neighborhood in our study clearly cannot be considered equivalent to high-rise developments with densities of several hundred dwellings per acre found in many urban areas.

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[3] To minimize family life cycle variability among respondents only residents of townhouses and single family homes were eligible to be interviewed; apartment dwellers were excluded. The definition of townhouse included structures with two or more units having a common wall, separate outdoor entrances, and no dwellings above or below the sampled dwelling.

Table 1

The Levels of Community Planning Represented Within The Density Categories in the Analysis

(percentage distribution of cases)

Levels of Community Planning	Dwelling Unit Densities per Acre					
	2.49 or less	2.50 to 3.49	3.50 to 4.49	4.50 to 8.49	8.50 to 12.49	12.50 to 25.00
Highly planned new towns[1]	56	35	36	89	97	92
Moderately planned communities[2]	21	34	10	2	3	8
Minimally planned communities[3]	23	31	54	9	-	-
Total	100	100	100	100	100	100
Number of cases	89	427	258	234	182	63

[1] Includes Columbia, Maryland; Reston, Virginia; Radburn, New Jersey; Lafayette Park-Elmwood Park in Detroit, Michigan; and the Southwest Redevelopment area in Washington, D.C.

[2] Includes Crofton, Maryland; and Montpelier, Maryland.

[3] Includes Norbeck, Maryland; Southfield, Michigan; and Glen Rock, New Jersey.

Survey Results

The effects of density on a number of behavioral responses to the neighborhood are summarized in Table 2. Information presented in the three main panels of the table correspond to the three planning objectives under investigation. Thus, data in the first panel include measures of accessibility to select community facilities; those shown in the second panel concern rates of neighborhood socializing; and those shown in the final panel include a range of additional factors which may be contributing to residents' satisfaction and identification with their neighborhoods.

Table 2

Neighborhood Attitudes and Behavioral Responses,
by Dwelling Unit Density

(percentages of respondents)

	Dwelling Units per Acre					
	2.49 or less	2.50 to 3.49	3.50 to 4.49	4.50 to 8.59	8.50 to 12.49	12.50 to 25.00
A. Accessibility to Facilities						
Percent within 1/2 mile of an outdoor swimming pool	28	38	31	82	76	92
Percent within 1/2 mile of tennis courts	29	40	27	58	50	56
Percent within 10 minutes of most often used grocery store	34	60	76	73	82	70
B. Social Interaction						
Proportion of nearby neighbors known by name						
All	65	59	60	57	43	8
Nearly all	17	25	25	22	23	11
Half of them	11	9	7	9	12	25
Just a few; none	7	7	8	12	22	56
Total	100	100	100	100	100	100
Frequency of casual interaction with neighbors						
Every day	17	16	26	24	21	11
Several times a week	45	40	40	41	35	37
Once a week	16	23	19	16	17	24
Less than once a week	22	21	15	19	27	28
Total	100	100	100	100	100	100

Table 2
(continued)

Neighborhood Attitudes and Behavioral Responses,
by Dwelling Unit Density

(percentages of respondents)

	Dwelling Units per Acre					
	2.49 or less	2.50 to 3.49	3.50 to 4.49	4.50 to 8.49	8.50 to 12.49	12.50 to 25.00
C. Factors Contributing to Neighborhood Satisfaction and Identification						
Frequency of hearing neighbors						
Very often	-	1	1	6	8	10
Occasionally	11	6	11	20	33	40
Almost never	89	93	89	74	59	50
Total	100	100	100	100	100	100
Overall noise level in neighborhood						
Noisy	2	2	3	4	3	2
	2	4	4	4	8	5
	5	15	18	17	16	28
↓	31	26	26	29	26	30
Quiet	60	53	49	46	47	35
Total	100	100	100	100	100	100
Adequate privacy in yard from neighbors						
Yes	57	53	49	53	54	40
No	43	47	51	47	46	60
Total	100	100	100	100	100	100

Table 2
(continued)

Neighborhood Attitudes and Behavioral Responses,
by Dwelling Unit Density

(percentages of respondents)

	Dwelling Units per Acre					
	2.49 or less	2.50 to 3.49	3.50 to 4.49	4.50 to 8.49	8.50 to 12.49	12.50 to 25.00
Adequacy of outdoor space for family's activities						
Right amount or more than needed	90	84	74	86	84	70
Too little	10	16	26	14	16	30
Total	100	100	100	100	100	100
Neighborhood maintenance level						
Well kept up	71	69	59	45	44	29
↓	24	25	35	39	33	52
	3	4	4	13	15	14
	1	1	1	3	5	5
Poorly kept up	1	1	1	-	3	-
Total	100	100	100	100	100	100
Rating of places near home for children's play (asked only in homes with child(ren) under 12)						
Excellent	50	44	37	57	42	17
Good	30	28	27	22	27	59
Average	13	16	18	12	18	12
Below average; poor	7	12	18	9	13	12
Total	100	100	100	100	100	100
Number of respondents to this question	56	279	155	108	66	17
Per cent of households having one or more children under 12	63	65	60	46	36	27
Total number of respondents	89	427	258	234	182	63

Accessibility to select community facilities: Our study has data on accessibility to only a limited number of facilities. From Table 2 it is clear that developers of higher density townhouse areas tend to include convenient outdoor swimming pools as one component of those neighborhoods. Tennis courts are also somewhat more likely to be easily accessible for residents in the higher density areas. However, in all areas except that with the lowest density, a majority of residents have convenient grocery shopping within 10 minutes.

Neighborhood socializing: Among the numerous studies which have attempted to quantify the effects of density and the physical environment on human behavior are several which have focused on social interaction. As the review of planning objectives might have predicted, an early study by Festinger et al. (1958) found that proximity of dwelling unit entrances was directly related to the frequency of casual interaction and subsequent growth of friendships. Residents who were physically more isolated from their neighbors tended to develop fewer friendships within the neighborhood.

A parallel study by Caplow and Forman (1950) also found that high interaction rates were influenced by physical accessibility in denser residential areas. While stressing the effects of propinquity in their findings, however, Caplow and Forman emphasized that the residents they studied were exceptionally homogeneous. All residents, for example, were married, most had children, the heads of virtually all the families were college students, and the dwellings were of basically identical design.

Drawing on these findings in addition to work of his own, Gans (1968) concluded that propinquity (as a reflection of high density) is less important than the compatibility of the residents in fostering interaction. Similar conclusions have been reported by Keller (1968) and Michelson (1970) who also suggested that sociability and perceived similarities with neighbors

are central for the extensiveness of neighborhood interaction, particularly among persons (like those in the present study) whose socioeconomic level permits a level of independence from neighbors in time of need. For example, in considering the research of Gans and others in a predominantly working class community in Boston, Massachusetts, Michelson concluded that the high residential densities strongly supported interaction patterns in the community. In fact, whereas these residents favored a high density environment characterized by three and four story apartment buildings, narrow streets, and interspersed stores, they pictured low density suburbs as cold and dreary places which would be unable to support their way of life (1970: 68-69).

In sum, several studies have shown that although density related phenomena such as propinquity and accessibility to neighbors are related to interaction, mediating factors such as compatability in style of life, education, income and stage in the family life cycle also strongly influence this relationship. As a result, there is a need to temper the expectation of a direct positive relationship between dwelling unit density and intense resident interaction which formed the basis for the fourth planning objective noted above. Therefore, rather than focus on more intimate types of neighborhood interaction (e.g., visiting in each other's homes, lending money) which might be more dependent on social rather than physical closeness, we will consider only two aspects of neighboring (knowing neighbors' names and casual chatting) which should be more sensitive to differences in physical rather than social closeness in the neighborhood.

Contrary to expectations, however, at densities of 4.50 dwellings per acre or higher, residents were increasingly likely to report a higher proportion of neighbors whom they did not know by name. (see Table 2.) In the more dense neighborhoods the closer one lives to neighbors, the fewer are known by name. In fact, compared to almost two-thirds of the residents of the least dense neighborhoods, only 8 percent of the residents living in the highly planned most dense neighborhoods felt they knew all the adults in the "half dozen families" living nearest to them by name.

While the extent of anonymity in denser areas is striking when stated in this manner, it is possible that, had we asked about the absolute number of people known by name within a defined area, say, two square acres, we might have shown that residents in high density areas know more people by name in their "neighborhood." In this context, the possibility that residents in higher density areas are less isolated than indicated by the acquaintance measure is suggested by the reduced effects of density on rates of casual social interaction. Since our focus for the interaction measure was the same half dozen families, this implies that while interaction in less dense areas may be spread out among several neighbors, residents of denser areas tend to interact frequently on a casual basis with a smaller proportion of their nearby neighbors.

Factors contributing to neighborhood satisfaction and identification: Further responses to the neighborhood may shed light on the final planning objective on the list which suggested that denser residential environments, if highly planned, are likely to foster feelings of neighborhood identification and satisfaction. In this study our measures of these factors were primarily indirect as is shown in the third panel of Table 2.

Given the relatively limited range of neighborhood densities up to only 25 dwellings per acre, it is interesting to note that the thresholds

for many neighborhood responses have already been reached. For example, at densities of 4.50 dwellings per acre or higher, residents are increasingly likely to report hearing their neighbors. As expected, there is also a regular increase in the "noisiness" of one's neighborhood as density increases. Privacy in one's yard, on the other hand, does not decrease until a density of 12.5 to 25 dwellings per acre is reached, at which point a sharp drop in feelings of privacy occurs. At least 70 percent of the residents at each level of density, however, indicated that they had the right amount or more outdoor space than they needed near home for family activities. Similarly, roughly two-thirds or more of the respondents with children under twelve in their families rated places for their children to play outdoors near home as "good" or "excellent." The fact that fewer people rated play areas "excellent" in the most dense neighborhoods should be considered cautiously in light of the limited number of cases involved. The tabulation of the proportion of families in our sample with children under twelve by density indicates a more regular inverse relationship. It is clear, in other words, that families with young children showed a tendency to choose less dense neighborhoods as a residential environment.

Previous work (Lansing and Marans, 1969; Kaiser et al., 1970; and Zehner, 1971.) has documented the importance of a neighborhood's maintenance level for resident reports of neighborhood satisfaction. Although almost none of the respondents at any density level felt that their neighborhoods were "poorly kept up," less than half of the residents in higher density areas (particularly over 12.50 dwellings per acre) rated their immediate surroundings as "well kept up." The extent to which maintenance problems can be alleviated by planning remains an empirical problem, but the relatively low levels of satisfaction with this aspect of the higher density

neighborhoods suggest that overall levels of residential satisfaction are likely to be lower in these areas.

Thus, in addition to these indirect indications of residents' satisfaction with their neighborhoods, a more direct measure of this variable was constructed as well. Specifically, we have already alluded to neighborhood as being defined by the five or six families or homes nearest to the respondent's dwelling. This "micro-neighborhood" definition provided us with a common unit to which residents could respond along several dimensions. Four dimensions were used to construct a neighborhood satisfaction scale. They relate to the respondents' ratings on the attractiveness, pleasantness, desirability as a place to live, and the overall appearance of the proximate neighborhood (Lansing et al., 102-103).

The relationship of density to the neighborhood satisfaction scale is shown in Table 3. Within the range of densities studied, densities from 2.5 to 8.49 dwellings per acre have little effect on satisfaction. In the least dense category (under 2.5 dwellings per acre), however, satisfaction is noticeably higher while it is noticeably lower in the highly planned but more dense neighborhoods (12.5 - 25 dwellings per acre).

Table 3

Neighborhood Satisfaction Related to Dwelling Unit Density

Dwelling Units Per Acre	Percent Giving Area Highest Rating on Neighborhood Satisfaction Scale[1]	N
2.49 or less	70	89
2.50 - 3.49	53	427
3.50 - 4.49	49	258
4.50 - 8.49	53	234
8.50 - 12.49	45	182
12.50 - 25.0	33	63

[1] Respondents giving their neighborhood the "highest ratings" include those who rated the neighborhood most positively on all four satisfaction scale components or most positively on three items and only one category less positively on the fourth.

To summarize these responses to aspects of neighborhood quality, the density of a residential neighborhood has had a variable effect. Reporting a "noisy" neighborhood and "hearing neighbors" increases fairly regularly with density. On the other hand, variation in density under 12.5 dwellings per acre appears to have little effect on judgements of the adequacy of private yard space for outdoor activities or the adequacy of children's play areas near home. Nevertheless, satisfaction with the neighborhood is higher in a very low density area and lower in the more dense neighborhoods, even though these neighborhoods were parts of several highly planned new towns.

Conclusion

In a study where socioeconomic and demographic characteristics of residents were, for the most part, comparable, several consequences of density for the quality of neighborhood life were considered.

First, we found that recreation facilities such as swimming pools and tennis courts are likely to be very convenient for a majority of the residents only in the higher density neighborhoods included in this study, while convenient grocery shopping was enjoyed by 60 percent or more of the residents in all but the areas with less than 2.50 dwellings per acre.

Further, contrary to the rationale of a frequently held planning objective, residents in highly planned neighborhoods with higher densities are much less likely to know their nearby neighbors by name although their rates of casual neighborhood interaction are only somewhat lower than rates in less dense areas. Finally, instead of being more satisfied with their place of residence, residents in the more dense highly planned neighborhoods

tended to be least satisfied with where they lived while those living in lower density areas were most satisfied.

Such findings, while by no means conclusive given the nature of affluent residents in the communities surveyed in this study, suggest that at this point in time even highly planned townhouse environments have not been able to satisfy the desires of people as well as lower density environments typified by single family homes. Further, given the discrepancies between frequently stated general planning objectives and some of the survey results in the denser highly planned environments, it seems clear that planners and designers of residential environments should make greater efforts to temper their objectives with a more realistic appraisal of their likelihood of attainment and of the desires of the prospective residents.

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